

SOME MICHIGAN RECORDS FOR *SARRACENIA*  
*PURPUREA* FORMA *HETEROPHYLLA*FREDERICK W. CASE, JR.<sup>1</sup>

IN 1822, Eaton described a plant from the region of Northampton, Mass. as a supposed new species, *Sarracenia heterophylla*, distinguished by elongate leaves and yellow flowers. Later investigations have shown that the plant is not morphologically different from *S. purpurea* except that it differs in the color of its leaves and flowers. The elongate type of leaf is merely a change caused by shade, similarly shaped leaves being found on shaded plants of the typical form. Consequently, recent authors have reduced the taxonomic status of the plant from species to subspecies, then variety, and finally, a form (Fernald, 1922, 1950, and Gleason, 1952). Bell in his recent cytotaxonomic study of the pitcher-plants (1949) follows the last treatment.<sup>2</sup> The purpose of the present paper is to present new data on the occurrence of this interesting plant in Michigan, the localities reported being a little over 600 miles west of the previously known localities, all of which are along the eastern seaboard. (See map, Fig. 1.)

*Sarracenia purpurea* forma *heterophylla*, as currently understood, is characterized by the complete absence of red coloring anywhere in the plant. The flower petals of living specimens are of a pale lemon-yellow to greenish-yellow color. The leaves, although dull green in shade grown specimens, are yellow-green to rich yellow in sunny situations. In dried material the colors may appear golden- or brown-yellow. If any red coloration is present at all, the plant cannot be regarded as forma *heterophylla*.

Until the presently described locations came to light, all authenticated records for *Sarracenia purpurea* f. *heterophylla* have been confined to the northeast coast of North America, and even here authentic records are extremely rare. Records do exist from the following localities, as reported by Bell (l. c.):

<sup>1</sup> I wish to thank Drs. C. Ritchie Bell, W. H. Wagner, Jr., and E. T. Wherry, for their suggestions. I am especially grateful to Drs. Bell and Wherry for visiting the areas with me on September 4, 1955.

<sup>2</sup> Bell (l.c.) suggests, however, that it is possible that forma *heterophylla* "may deserve higher taxonomic rank."



Northampton, Mass. (where it was collected by Eaton); Main Arm, Bonne Bay, Newfoundland (Fernald and Long); Exploits River and Badger Brook, Newfoundland (Robinson and Schrenk); Young's Lake, Belle Isle, Nova Scotia (Fernald, and also Bell); and Forked River, New Jersey (Britton). Schallert applied the name "heterophylla" to herbarium material from North Carolina, but Bell discounts his records, since most of his specimens show red veining, and therefore should be excluded from this taxon (Bell, 1949). It is likely that all of Schallert's identifications represent deep shade ecads of typical *S. purpurea*.

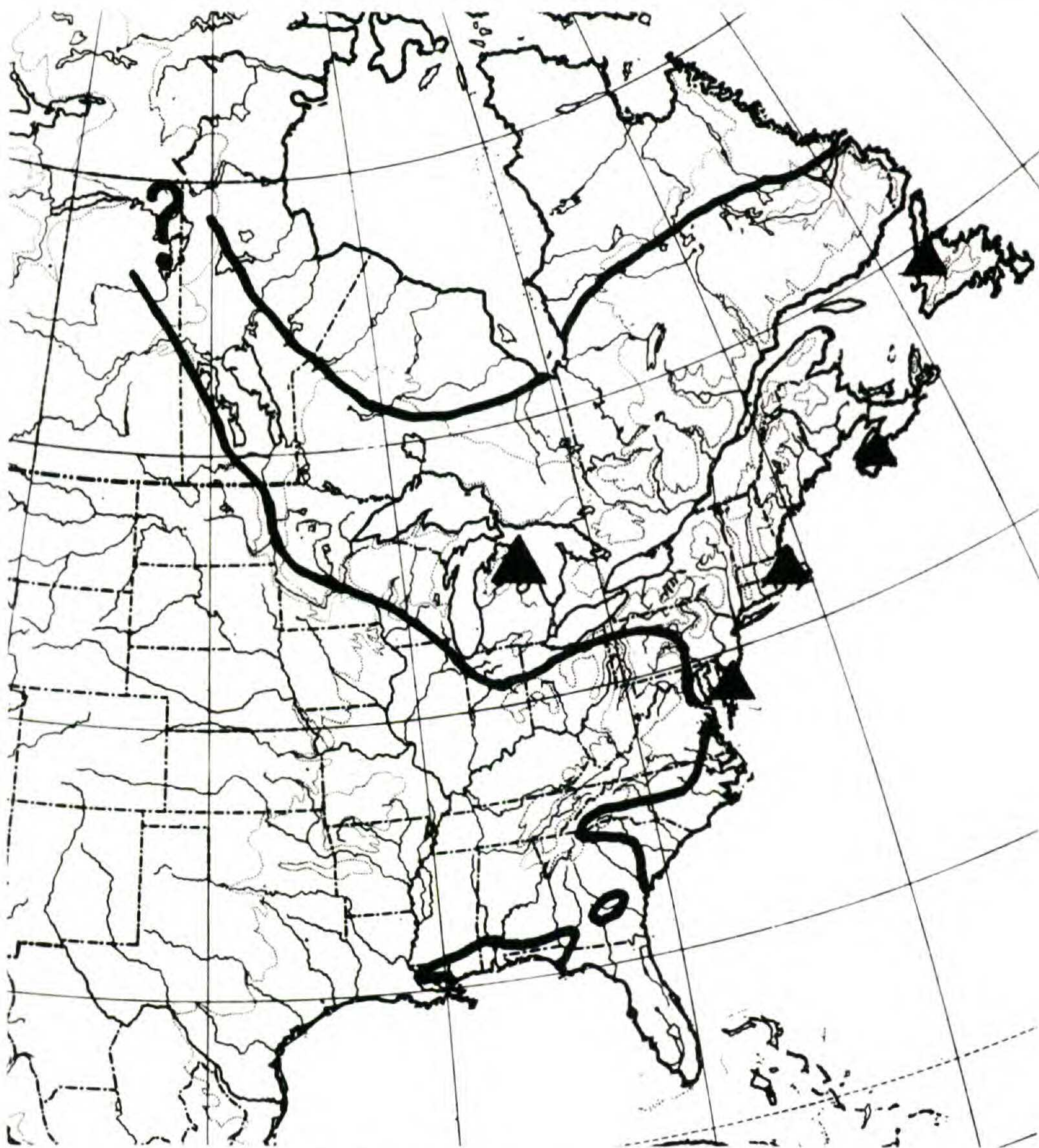


FIGURE 1. The distribution of *Sarracenia purpurea* in North America. The triangles represent authenticated localities for the forma *heterophylla*. General distribution adapted from E. T. Wherry, 1935.



In June, 1948, while botanizing in Montmorency County, Michigan, I came upon yellow-flowered plants of *Sarracenia purpurea* in a large spruce-tamarack bog, but at that time no record of the extent of distribution or of the number of yellow plants was made. Subsequent exploration revealed that forma *heterophylla* occurred in a number of bogs in this vicinity. When it became apparent that the numbers and distribution of the form in this area might possibly show some evolutionary pattern, a more extensive study was initiated. All of the bogs that the author could locate and to which he could gain access were explored during the years 1954 and 1955. This is not to imply, of course, that all suitable habitats in this bog-rich area have

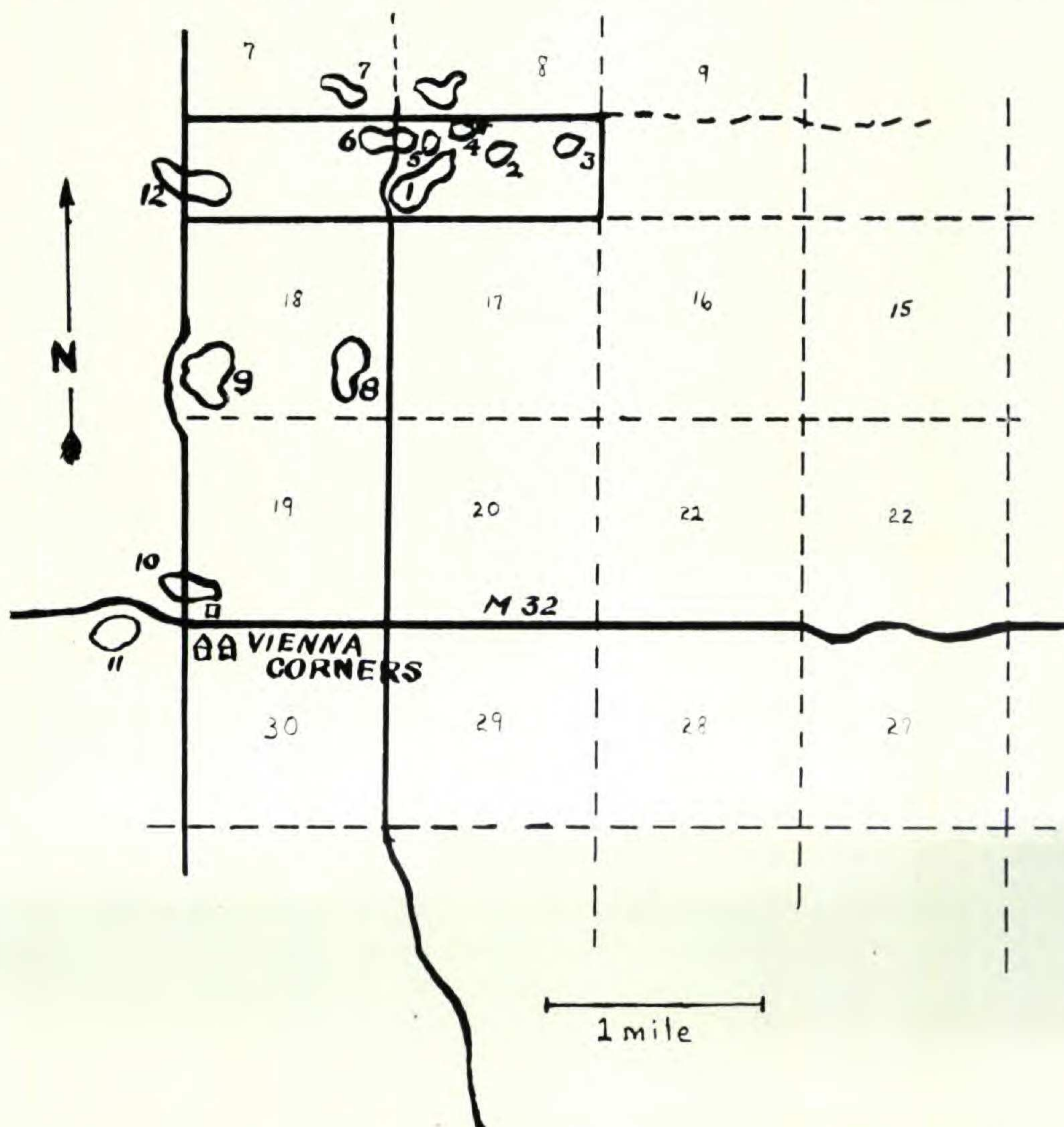


FIGURE 2. Portion of Township 30 N., Range 1 E., Montmorency County, Michigan, showing location of the explored bogs.



been covered; there are possibly others in which forma *heterophylla* will be discovered.

The locations of the explored bogs are shown on the accompanying map (Fig. 2). Forma *heterophylla* was found to occur in the bogs numbered 1, 2, 3, 8, and 9. A few of the plants found in bogs 6 and 7 appeared to be forma *heterophylla* but, as they were deeply shaded, final confirmation should be reserved until flowering specimens are seen. All the bogs are in Township 30 N., Range 1 E., Montmorency County, Michigan. Bogs 1, 2, 3, and 5 are in the south half of Section 8; bog 6 on the line between sections 7 and 8; bog 7 in the north half of Sect. 7; and bogs 8 and 9 are in Sect. 18 of the same township. All of the bogs are rather open *Picea-Larix* associations on Greenwood Peat soils (Veach et al. 1930). Living specimens of taxon *heterophylla* from these locations are in the author's greenhouse. Herbarium material, Case 900 to 908, and Bell 1548, will be deposited in the University of Michigan Herbarium, Gray Herbarium, the U. S. National Herbarium, and the University of North Carolina Herbarium.

To determine something of the ratio of occurrence of the red and the yellow forms, a series of counts was made. It must be stressed that any color comparisons must be taken on plants growing in the open. Only in complete sunlight does the coloring present develop fully, eliminating the confusion of greenish ecads which are genotypically red with the true anthocyanin-free forms. Plots 9 yards square were selected more or less at random from the open areas of bogs 1, 3, and 9. A record was made of the number of red-leaved plants and of the number of yellow-leaved plants with mature leaves in each plot. The findings are shown in the table below.

| <i>Bog</i> | <i>Plot</i> | <i>Red form</i> | <i>Yellow form</i> |
|------------|-------------|-----------------|--------------------|
| 1          | 1           | 129             | 16                 |
| —          | 2           | 77              | 21                 |
| 3          | 1           | 29              | 37                 |
| —          | 2           | 7               | 34                 |
| 9          | 1           | 28              | 26                 |
| —          | 2           | 25              | 20                 |

The data are too few to be considered as a final indication of the rate of occurrence of the two forms in Montmorency Co.,



Michigan. Yet they show that in some of the bogs, at least, forma *heterophylla* is very well developed. Especially interesting is the observation that in each of bogs 1, 3, and 9 there is a considerable number of plants of an orange-red color which do not fit the concept of either the typical red or the yellow form. In the above counts, however, such plants were treated arbitrarily as red. These orange-red plants, not found in bogs unless the yellow form was present also, lead me to believe that forma *heterophylla* is not behaving as a simple Mendelian recessive, and that the possibility of genetic blending must be considered. In order to obtain more information on the genetic nature of forma *heterophylla* I have initiated various greenhouse breeding experiments which should provide some insight into the situation, and which will be duly reported upon.

#### SUMMARY

The history and nature of *Sarracenia purpurea* forma *heterophylla* is briefly reviewed and maps of its known occurrence are presented. A number of new localities have been discovered in Montmorency Co., Michigan, over 600 miles west of the nearest localities heretofore recorded. Results of sample counts in various bogs where the two color forms occur together are given. A number of individuals in which the dominant color is orange-red suggest that genetic intermediates between the two forms may exist.

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